

Notice of Allowability

Application No.

10/603,286

Examiner

Alicia M Harrington

Applicant(s)

COBB ET AL.

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2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to application and IDS filed on 6/25/03.
2. ☒ The allowed claim(s) is/are 1-86.
3. ☒ The drawings filed on 25 June 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

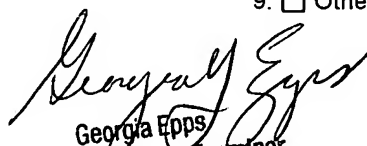
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 0603
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 0904
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


Georgia Epps
Supervisory Patent Examiner
Technology Center 2800
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EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. Authorization for this examiner's amendment was given in a telephone interview with Nelson Blish on 9/1/04.

3. The application has been amended as follows:

In the specification at page 1, lines 3-19:

Reference is made to commonly-assigned copending U.S. Patent Application Serial No. 09/813,207, filed March 20, 2001, entitled A DIGITAL CINEMA PROJECTOR, by Kurtz et al., now US Patent 6,585,378; U.S. Patent Application Serial No. 10/040,663, filed January 7, 2002, entitled DISPLAY APPARATUS USING A WIRE GRID POLARIZING BEAMSPLIWER WITH COMPENSATOR, by Mi et al.; U.S. Patent Application Serial No. 10/050,309, filed January 16, 2002, entitled PROJECTION APPARATUS USWG SPATIAL LIGHT MODULATOR, by Joshua M. Cobb; U.S. Patent Application Serial No. 10/131,871, filed April 25, 2002, entitled PROJECTION APPARATUS USING SPATIAL LIGHT MODULATOR WITH RELAY LENS AND DICHROIC COMBINER, by Cobb et al. now US Patent 6,676,260; U.S. Patent Application Serial No. 10/237,516, filed September 9, 2002, entitled COLOR ILLUMINATION SYSTEM FOR SPATIAL LIGHT MODULATORS USING MULTIPLE DOUBLE TELECENTRIC RELAYS, by Joshua M. Cobb; and U.S.

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Patent Application Serial No. 10/392,685, filed March 20, 2003, entitled PROJECTION APPARATUS USING TELECENTRIC OPTICS, by Cobb et al. ,now US Patent 6,758,565, the disclosures of which are incorporated herein.

In the claims:

25. (Currently amended) A modulation optical system for providing modulation of an incident light beam comprising:

(a) a prepolarizer for pre-polarizing said beam of light to provide a polarized beam of light;

(b) a wire grid polarization beamsplitter for receiving said polarized beam of light, for transmitting said polarized beam of light having a first polarization, and for reflecting said polarized beam of light having a second polarization orthogonal to said first polarization, wherein subwavelength wires on said wire grid polarization beamsplitter face a reflective spatial light modulator;

(c) wherein said reflective spatial light modulator receives said polarized beam of light, having either a first polarization or a second polarization, and selectively modulates said polarized beam of light to encode data thereon, providing both modulated light and unmodulated light which differ in polarization;

(d) wherein said reflective spatial light modulator reflects back both said modulated light and said unmodulated light to said wire grid polarization beamsplitter;

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(e) wherein a polarization compensator, located between said wire grid polarization beamsplitter and said reflective liquid crystal device, is provided for conditioning oblique light rays;

(f) wherein said wire grid polarization beamsplitter separates said modulated light from said unmodulated light;

(g) a polarization analyzer receives said modulated light, and which further removes any residual unmodulated light from said modulated light; and

wherein said modulation optical system further comprises an imager field lens prior to ~~each of~~ said reflective spatial light modulators to provide nominally telecentric light to said spatial light modulators.

4. The following is an examiner's statement of reasons for allowance:

Regarding claim 1, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such manner that a rejection under 35 U.S.C 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include a display apparatus where a wire grid polarization beamsplitter for receiving said polarized beam of light, for transmitting said polarized beam of light having a first polarization, and for reflecting said polarized beam of light having a second polarization orthogonal to said first polarization, wherein subwavelength wires on said wire grid polarization beamsplitter face a reflective spatial light modulator; an imaging relay lens in each color that provides an intermediate image of the reflective spatial light

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modulator from the modulated light for that color; a dichroic combiner for re-combining the modulated light for each given color, such that the multiple color beams form the respective intermediate images along a common optical axis to form a combined intermediate image as claimed.

Regarding claim 25, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such manner that a rejection under 35 U.S.C 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include a wire grid polarization beamsplitter for receiving said polarized beam of light, for transmitting said polarized beam of light having a first polarization, and for reflecting said polarized beam of light having a second polarization orthogonal to said first polarization, wherein subwavelength wires on said wire grid polarization beamsplitter face a reflective spatial light modulator; and wherein a polarization compensator, located between said wire grid polarization beamsplitter and said reflective liquid crystal device, is provided for conditioning oblique light rays as claimed.

Regarding claim 40 and 59, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such manner that a rejection under 35 U.S.C 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include a modulation optical system wherein a polarization compensator, located between said wire grid polarization beamsplitter and said reflective liquid crystal device, is provided for conditioning oblique light rays as claimed.

Regarding claim 80, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such manner that a rejection under 35 U.S.C

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102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include a display apparatus wherein a polarization compensator, located between said wire grid polarization beamsplitter and said reflective spatial light modulator, is provided for conditioning oblique light rays as claimed.

Regarding claim 84, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such manner that a rejection under 35 U.S.C.

102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include a display apparatus wherein an imaging relay lens in each color that provides an intermediate image of the digital micromirror device from the modulated light for that color; and a dichroic combiner for re-combining the modulated light for each given color, such that the multiple color beams form the respective intermediate images along a common optical axis to form a combined intermediate image.

Regarding claim 86, prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the dependent claims, in such manner that a rejection under 35 U.S.C.

102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which at least include a modulation optical system with a polarization optical system with at least two polarization devices wherein said polarization beamsplitter separates said modulated light from said unmodulated light; and wherein said modulation optical system further comprises an imager field lens prior to said reflective spatial light modulator as claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

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fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Information Disclosure Statement

5. The Examiner has considered the information disclosure statement filed on 6/25/03.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bone (US 6,536,903) discloses a system and method for improving contrast in an electro-optical imaging system.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alicia M Harrington whose telephone number is 571 272 2330. The examiner can normally be reached on Monday - Thursday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571 272 2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alicia M Harrington

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Examiner

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